



SEQUENCE LISTING

<110> Schofield, Julian

Rademacher, Thomas W

<120> Glycosyl phosphatidyl inositol specific phospholipase D
proteins and uses thereof

<130> 55908(46322)

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<141> 2001-06-22

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<150> GB 9828712.1

<151> 1998-12-24

<150> GB 9828715.4

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Tyr Arg Glu Leu Leu Leu Glu His Gln Asp Ala Tyr Gln Ala Gly Ile
50 55 60

Val Phe Pro Asp Cys Phe Tyr Pro Ser Ile Cys Lys Gly Gly Lys Phe
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His Asp Val Ser Glu Ser Thr His Trp Thr Pro Phe Leu Asn Ala Ser
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Val His Tyr Ile Arg Glu Asn Tyr Pro Leu Pro Trp Glu Lys Asp Thr
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Glu Lys Leu Val Ala Phe Leu Phe Gly Ile Thr Ser His Met Ala Ala
115 120 125

Asp Val Ser Trp His Ser Leu Gly Leu Glu Gln Gly Phe Leu Arg Thr
130 135 140

Met Gly Ala Ile Asp Phe His Gly Ser Tyr Ser Glu Ala His Ser Ala
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260 265 270
Thr Ser Asp Cys Asn Leu Pro Glu Asn Pro Glu Asn Pro Leu Phe Ile
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Ala Cys Gly Gly Gln Gln Asn His Thr Gln Gly Ser Lys Met Gln Lys
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Gln Leu Thr Tyr Lys Gly Ala Val Tyr Val Tyr Phe Gly Ser Lys Gln

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690 695 700

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725 730 735

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Leu Ile Gly Gly Glu Asp Gly Arg Val Tyr Val Tyr Asn Gly Lys Glu

755 760 765

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Cys Pro Glu Glu Lys Ala Gln Tyr Val Leu Ile Ser Pro Glu Ala Ser

785 790 795 800

Ser Arg Phe Gly Ser Ser Leu Ile Thr Val Arg Ser Lys Ala Lys Asn

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Tyr Lys Glu Leu Leu Leu Arg His Gln Asp Ala Tyr Gln Ala Gly Ser

50 55 60

Val Phe Pro Asp Ser Phe Tyr Pro Ser Ile Cys Glu Arg Gly Gln Phe

65 70 75 80

His Asp Val Ser Glu Ser Thr His Trp Thr Pro Phe Leu Asn Ala Ser

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Val His Tyr Ile Arg Lys Asn Tyr Pro Leu Pro Trp Asp Glu Asp Thr

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Glu Lys Leu Val Ala Phe Leu Phe Gly Ile Thr Ser His Met Val Ala

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Tyr Leu Ser Arg His Trp Tyr Val Pro Ala Glu Asp Leu Leu Gly Ile

180 185 190

Tyr Arg Glu Leu Tyr Gly Arg Ile Val Ile Thr Lys Lys Ala Ile Val

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785 790 795 800

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Thr Val Phe Pro Asp Cys Phe Tyr Pro Ser Leu Cys Lys Gly Gly Lys
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Phe His Asp Val Ser Glu Ser Thr His Trp Thr Pro Phe Leu Asn Ala
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Ser Val His Tyr Ile Arg Glu Asn Tyr Pro Leu Pro Trp Glu Lys Asp
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Thr Met Gly Ala Ile Asp Phe His Gly Ser Tyr Ser Glu Ala His Ser
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Asn Tyr Leu Ala Arg Arg Trp Tyr Val Pro Val Lys Asp Leu Leu Gly
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245 250 255

Phe Trp Ser Thr Asn Ile Tyr His Leu Thr Ser Phe Met Leu Glu Asn
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Gly Thr Ser Asp Cys Ser Leu Phe Glu Asn Pro Glu Asn Pro Leu Phe
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Lys Asn Asp Phe His Arg Asn Leu Thr Ser Ser Leu Thr Glu Asn Ile
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Asp Leu Val Val Gly Ala Pro Gly Tyr Ser Arg Pro Gly Arg Ile His
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Ile Gly Arg Val Tyr Leu Ile Tyr Gly Asn Glu Leu Gly Leu Pro Pro
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Val Asp Leu Asp Leu Asp Lys Glu Ala His Gly Ile Leu Glu Gly Phe
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Gln Pro Ser Gly Arg Phe Gly Ser Ala Leu Ala Met Leu Asp Phe Asn
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Met Asp Gly Val Pro Asp Leu Ala Val Gly Ala Pro Ser Val Gly Ser

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Glu Gln Leu Thr Tyr Lys Gly Ala Val Tyr Val Tyr Phe Gly Ser Lys

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Gln Gly Arg Met Ser Ser Ser Pro Asn Ile Thr Ile Ser Cys Gln Asp

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Ile Tyr Cys Asn Leu Gly Trp Thr Leu Leu Ala Ala Asp Val Asn Gly

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Asp Ser Glu Pro Asp Leu Val Ile Gly Ser Pro Phe Ala Pro Gly Gly

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Gly Lys Gln Lys Gly Ile Val Ala Ala Phe Tyr Ser Gly Pro Ser Leu

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Gly Glu Glu Asp Phe Ala Trp Phe Gly Tyr Ser Leu His Gly Val Thr

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Val Asp Asn Arg Thr Leu Leu Leu Val Gly Ser Pro Thr Trp Lys Asn

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Ala Ser Arg Leu Gly Arg Leu Leu His Ile Arg Asp Glu Lys Lys Ser

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Leu Gly Arg Val Tyr Gly Tyr Phe Pro Pro Asn Ser Gln Ser Trp Phe

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675 680 685

Thr Leu His Gln Gly Gly Ala Thr Arg Met Tyr Ala Leu Thr Ser Asp
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Leu Gln Pro Pro Leu Leu Ser Thr Phe Ser Gly Asp Arg Arg Phe Ser
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Arg Phe Gly Gly Val Leu His Leu Ser Asp Leu Asp Asp Asp Gly Val
725 730 735

Asp Glu Ile Ile Val Ala Ala Pro Leu Arg Ile Ala Asp Val Thr Ser
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Gly Leu Ile Gly Gly Glu Asp Gly Arg Val Tyr Val Tyr Asn Gly Lys
755 760 765

Glu Thr Thr Leu Gly Asp Met Thr Gly Lys Cys Lys Ser Trp Met Thr
770 775 780

Pro Cys Pro Glu Glu Lys Ala Gln Tyr Val Leu Ile Ser Pro Glu Ala
785 790 795 800

Ser Ser Arg Phe Gly Ser Ser Leu Ile Thr Val Arg Ser Lys Ala Lys
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<210> 9

<211> 1259

<212> DNA

<213> Homo sapiens

<400> 9

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<210> 10

<211> 509

<212> PRT

<213> Homo sapiens

<400> 10

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Lys His Val Ser Ser Pro Leu Ala Ser Tyr Phe Leu Ser Phe Pro Tyr

35 40 45

Ala Arg Leu Gly Trp Ala Met Thr Ser Ala Asp Leu Asn Gln Asp Gly

50 55 60

His Gly Asp Leu Val Val Gly Ala Pro Gly Tyr Ser Arg Pro Gly His

65 70 75 80

Ile His Ile Gly Arg Val Tyr Leu Ile Tyr Gly Asn Asp Leu Gly Leu

85 90 95

Pro Pro Val Asp Leu Asp Leu Asp Lys Glu Ala His Arg Ile Leu Glu

100 105 110

Gly Phe Gln Pro Ser Gly Arg Phe Gly Ser Ala Leu Ala Val Leu Asp

115 120 125

Phe Asn Val Asp Gly Val Pro Asp Leu Ala Val Gly Ala Pro Ser Val

130 135 140

Gly Ser Glu Gln Leu Thr Lys Gly Ala Val Tyr Val Tyr Phe Gly Ser

145 150 155 160

Lys Gln Gly Gly Met Ser Ser Ser Pro Asn Ile Thr Ile Ser Cys Gln

165 170 175

Asp Ile Tyr Cys Asn Leu Gly Trp Thr Leu Leu Ala Ala Asp Val Asn

180 185 190

Gly Asp Ser Glu Pro Asp Leu Val Ile Gly Ser Pro Phe Ala Pro Gly

195 200 205

Gly Gly Lys Gln Lys Gly Ile Val Ala Ala Phe Tyr Ser Gly Pro Ser

210 215 220

Leu Ser Asp Lys Glu Lys Leu Asn Val Glu Ala Ala Asn Trp Thr Val

225 230 235 240

Arg Gly Glu Glu Asp Phe Ser Trp Phe Gly Tyr Ser Leu His Gly Val

245 250 255

Thr Val Asp Asn Arg Thr Leu Leu Leu Val Gly Ser Pro Thr Trp Lys

260 265 270

Asn Ala Ser Arg Leu Gly His Leu Leu His Ile Arg Asp Glu Lys Lys
275 280 285

Ser Leu Gly Arg Val Tyr Gly Tyr Phe Pro Pro Asn Gly Gln Ser Trp
290 295 300

Phe Thr Ile Ser Gly Asp Lys Ala Met Gly Lys Leu Gly Thr Ser Leu
305 310 315 320

Ser Ser Gly His Val Leu Met Asn Gly Thr Leu Lys Gln Val Leu Leu
325 330 335

Val Gly Ala Pro Thr Tyr Asp Asp Val Ser Lys Val Ala Phe Leu Thr
340 345 350

Val Thr Leu His Gln Gly Gly Ala Thr Arg Met Tyr Ala Leu Ile Ser
355 360 365

Asp Ala Gln Pro Leu Leu Leu Ser Thr Phe Ser Gly Asp Arg Arg Phe
370 375 380

Ser Arg Phe Gly Gly Val Leu His Leu Ser Asp Leu Asp Asp Asp Gly
385 390 395 400

Leu Asp Glu Ile Ile Met Ala Ala Pro Leu Arg Ile Ala Asp Val Thr
405 410 415

Ser Gly Leu Ile Gly Gly Glu Asp Gly Arg Val Tyr Val Tyr Asn Gly
420 425 430

Lys Glu Thr Thr Leu Gly Asp Met Thr Gly Lys Cys Lys Ser Trp Ile
435 440 445

Thr Pro Cys Pro Glu Glu Lys Ala Gln Tyr Val Leu Ile Ser Pro Glu
450 455 460

Ala Ser Ser Arg Phe Gly Ser Ser Leu Ile Thr Val Arg Ser Lys Ala
 465 470 475 480

Lys Asn Gln Val Val Ile Ala Ala Gly Arg Ser Ser Leu Gly Ala Arg
 485 490 495

Leu Ser Gly Ala Leu His Val Tyr Ser Leu Gly Ser Asp
 500 505

<210> 11

<211> 795

<212> PRT

<213> Homo sapiens

<400> 11

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Leu Cys His Arg Gly Ser Pro Cys Gly Leu Ser Thr His Ile Glu Ile
 20 25 30

Gly His Arg Ala Leu Glu Phe Leu Gln Leu His Asn Gly Arg Val Asn
 35 40 45

Tyr Arg Glu Leu Leu Leu Glu His Gln Asp Ala Tyr Gln Ala Gly Ile
 50 55 60

Val Phe Pro Asp Cys Phe Tyr Pro Ser Ile Cys Lys Gly Gly Lys Phe
 65 70 75 80

His Asp Val Ser Glu Ser Thr His Trp Thr Pro Phe Leu Asn Ala Ser
 85 90 95

Val His Tyr Ile Arg Glu Asn Tyr Pro Leu Pro Trp Glu Lys Asp Thr
 100 105 110

Glu Lys Leu Val Ala Phe Leu Phe Gly Ile Thr Ser His Met Ala Ala
 115 120 125

Asp Val Ser Trp His Ser Leu Gly Leu Glu Gln Gly Phe Leu Arg Thr
 130 135 140

Met Gly Ala Ile Asp Phe His Gly Ser Tyr Ser Glu Ala His Ser Ala
 145 150 155 160

Gly Asp Phe Gly Gly Asp Val Leu Ser Gln Phe Glu Phe Asn Phe Asn
 165 170 175

Tyr Leu Ala Arg Arg Trp Tyr Val Pro Val Lys Asp Leu Leu Gly Ile
 180 185 190

Tyr Glu Lys Leu Tyr Gly Arg Lys Val Ile Thr Glu Asn Val Ile Val
 195 200 205

Asp Cys Ser His Ile Gln Phe Leu Glu Met Tyr Gly Glu Met Leu Ala
 210 215 220

Val Ser Lys Leu Tyr Pro Thr Tyr Ser Thr Lys Ser Pro Phe Leu Val
 225 230 235 240

Glu Gln Phe Gln Glu Tyr Phe Leu Gly Gly Leu Asp Asp Met Ala Phe
 245 250 255

Trp Ser Thr Asn Ile Tyr His Leu Thr Ser Phe Met Leu Glu Asn Gly
 260 265 270

Thr Ser Asp Cys Asn Leu Pro Glu Asn Pro Leu Phe Ile Ala Cys Gly

275 280 285
Gly Gln Gln Asn His Thr Gln Gly Ser Lys Met Gln Lys Asn Asp Phe
290 295 300
His Arg Asn Leu Thr Thr Ser Leu Thr Glu Ser Val Asp Arg Asn Ile
305 310 315 320
Asn Tyr Thr Glu Arg Gly Val Phe Phe Ser Val Asn Ser Trp Thr Pro
325 330 335
Asp Ser Met Ser Phe Ile Tyr Lys Ala Leu Glu Arg Asn Ile Arg Thr
340 345 350
Met Phe Ile Gly Gly Ser Gln Leu Ser Gln Lys His Val Ser Ser Pro
355 360 365
Leu Ala Ser Tyr Phe Leu Ser Phe Pro Tyr Ala Arg Leu Gly Trp Ala
370 375 380
Met Thr Ser Ala Asp Leu Asn Gln Asp Gly His Gly Asp Leu Val Val
385 390 395 400
Gly Ala Pro Gly Tyr Ser Arg Pro Gly His Ile His Ile Gly Arg Val
405 410 415
Tyr Leu Ile Tyr Gly Asn Asp Leu Gly Leu Pro Pro Val Asp Leu Asp
420 425 430
Leu Asp Lys Glu Ala His Arg Ile Leu Glu Gly Phe Gln Pro Ser Gly
435 440 445
Arg Phe Gly Ser Ala Leu Ala Val Leu Asp Phe Asn Val Asp Gly Val
450 455 460

Pro Asp Leu Ala Val Gly Ala Pro Ser Val Gly Ser Glu Gln Leu Thr
465 470 475 480

Tyr Lys Gly Ala Val Tyr Val Tyr Phe Gly Ser Lys Gln Gly Gly Met
 485 490 495

Ser Ser Ser Pro Asn Ile Thr Ile Ser Cys Gln Asp Ile Tyr Cys Asn
 500 505 510

Leu Gly Trp Thr Leu Leu Ala Ala Asp Val Asn Gly Asp Ser Glu Pro
 515 520 525

Asp Leu Val Ile Gly Ser Pro Phe Ala Pro Gly Gly Gly Lys Gln Lys
 530 535 540

Gly Ile Val Ala Ala Phe Tyr Ser Gly Pro Ser Leu Ser Asp Lys Glu
545 550 555 560

ai Lys Leu Asn Val Glu Ala Ala Asn Trp Thr Val Arg Gly Glu Glu Asp
 565 570 575

Phe Ser Trp Phe Gly Tyr Ser Leu His Gly Val Thr Val Asp Asn Arg
 580 585 590

Thr Leu Leu Leu Val Gly Ser Pro Thr Trp Lys Asn Ala Ser Arg Leu
 595 600 605

Gly His Leu Leu His Ile Arg Asp Glu Lys Lys Ser Leu Gly Arg Val
 610 615 620

Tyr Gly Tyr Phe Pro Pro Asn Gly Gln Ser Trp Phe Thr Ile Ser Gly
625 630 635 640

Asp Lys Ala Met Gly Lys Leu Gly Thr Ser Leu Ser Ser Gly His Val
 645 650 655

Leu Met Asn Gly Thr Leu Lys Gln Val Leu Leu Val Gly Ala Pro Thr
 660 665 670

Tyr Asp Asp Val Ser Lys Val Ala Phe Leu Thr Val Thr Leu His Gln
 675 680 685

Gly Gly Ala Thr Arg Met Tyr Ala Leu Ile Ser Asp Ala Gln Pro Leu
 690 695 700

Leu Leu Ser Thr Phe Ser Gly Asp Arg Arg Phe Ser Arg Phe Gly Gly
 705 710 715 720

Val Leu His Leu Ser Asp Leu Asp Asp Asp Gly Leu Asp Glu Ile Ile
 725 730 735

Met Ala Ala Pro Leu Arg Ile Ala Asp Val Thr Ser Gly Leu Ile Gly
 740 745 750

Gly Glu Asp Gly Arg Val Tyr Val Tyr Asn Gly Lys Glu Thr Thr Leu
 755 760 765

Gly Asp Met Thr Gly Lys Cys Lys Ser Trp Ile Thr Pro Cys Pro Glu
 770 775 780

Glu Lys Val Ser Glu Lys Lys Lys Lys Lys Lys
 785 790 795

<210> 12

<211> 840

<212> PRT

<213> Homo sapiens

<400> 12

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Leu Cys His Arg Gly Ser Pro Cys Gly Leu Ser Thr His Ile Glu Ile

20 25 30

Gly His Arg Ala Leu Glu Phe Leu Gln Leu His Asn Gly Arg Val Asn

35 40 45

Tyr Arg Glu Leu Leu Leu Glu His Gln Asp Ala Tyr Gln Ala Gly Ile

50 55 60

Val Phe Pro Asp Cys Phe Tyr Pro Ser Ile Cys Lys Gly Gly Lys Phe

65 70 75 80

His Asp Val Ser Glu Ser Thr His Trp Thr Pro Phe Leu Asn Ala Ser

85 90 95

Val His Tyr Ile Arg Glu Asn Tyr Pro Leu Pro Trp Glu Lys Asp Thr

100 105 110

Glu Lys Leu Val Ala Phe Leu Phe Gly Ile Thr Ser His Met Ala Ala

115 120 125

Asp Val Ser Trp His Ser Leu Gly Leu Glu Gln Gly Phe Leu Arg Thr

130 135 140

Met Gly Ala Ile Asp Phe His Gly Ser Tyr Ser Glu Ala His Ser Ala

145 150 155 160

Gly Asp Phe Gly Gly Asp Val Leu Ser Gln Phe Glu Phe Asn Phe Asn

165 170 175

Tyr Leu Ala Arg Arg Trp Tyr Val Pro Val Lys Asp Leu Leu Gly Ile

180 185 190

Tyr Glu Lys Leu Tyr Gly Arg Lys Val Ile Thr Glu Asn Val Ile Val

195 200 205

Asp Cys Ser His Ile Gln Phe Leu Glu Met Tyr Gly Glu Met Leu Ala

210 215 220

Val Ser Lys Leu Tyr Pro Thr Tyr Ser Thr Lys Ser Pro Phe Leu Val

225 230 235 240

Glu Gln Phe Gln Glu Tyr Phe Leu Gly Gly Leu Asp Asp Met Ala Phe

245 250 255

Trp Ser Thr Asn Ile Tyr His Leu Thr Ser Phe Met Leu Glu Asn Gly

260 265 270

Thr Ser Asp Cys Asn Leu Pro Glu Asn Pro Leu Phe Ile Ala Cys Gly

275 280 285

Gly Gln Gln Asn His Thr Gln Gly Ser Lys Met Gln Lys Asn Asp Phe

290 295 300

His Arg Asn Leu Thr Thr Ser Leu Thr Glu Ser Val Asp Arg Asn Ile

305 310 315 320

Asn Tyr Thr Glu Arg Gly Val Phe Phe Ser Val Asn Ser Trp Thr Pro

325 330 335

Asp Ser Met Ser Phe Ile Tyr Lys Ala Leu Glu Arg Asn Ile Arg Thr

340 345 350

Met Phe Ile Gly Gly Ser Gln Leu Ser Gln Lys His Val Ser Ser Pro

355 360 365

Leu Ala Ser Tyr Phe Leu Ser Phe Pro Tyr Ala Arg Leu Gly Trp Ala
370 375 380

Met Thr Ser Ala Asp Leu Asn Gln Asp Gly His Gly Asp Leu Val Val
385 390 395 400

Gly Ala Pro Gly Tyr Ser Arg Pro Gly His Ile His Ile Gly Arg Val
405 410 415

Tyr Leu Ile Tyr Gly Asn Asp Leu Gly Leu Pro Pro Val Asp Leu Asp
420 425 430

Leu Asp Lys Glu Ala His Arg Ile Leu Glu Gly Phe Gln Pro Ser Gly
435 440 445

Arg Phe Gly Ser Ala Leu Ala Val Leu Asp Phe Asn Val Asp Gly Val
450 455 460

Pro Asp Leu Ala Val Gly Ala Pro Ser Val Gly Ser Glu Gln Leu Thr
465 470 475 480

Tyr Lys Gly Ala Val Tyr Val Tyr Phe Gly Ser Lys Gln Gly Gly Met
485 490 495

Ser Ser Ser Pro Asn Ile Thr Ile Ser Cys Gln Asp Ile Tyr Cys Asn
500 505 510

Leu Gly Trp Thr Leu Leu Ala Ala Asp Val Asn Gly Asp Ser Glu Pro
515 520 525

Asp Leu Val Ile Gly Ser Pro Phe Ala Pro Gly Gly Gly Lys Gln Lys
530 535 540

Gly Ile Val Ala Ala Phe Tyr Ser Gly Pro Ser Leu Ser Asp Lys Glu
545 550 555 560

Q1

Lys Leu Asn Val Glu Ala Ala Asn Trp Thr Val Arg Gly Glu Glu Asp

565 570 575

Phe Ser Trp Phe Gly Tyr Ser Leu His Gly Val Thr Val Asp Asn Arg

580 585 590

Thr Leu Leu Leu Val Gly Ser Pro Thr Trp Lys Asn Ala Ser Arg Leu

595 600 605

Gly His Leu Leu His Ile Arg Asp Glu Lys Lys Ser Leu Gly Arg Val

610 615 620

Tyr Gly Tyr Phe Pro Pro Asn Gly Gln Ser Trp Phe Thr Ile Ser Gly

625 630 635 640

Asp Lys Ala Met Gly Lys Leu Gly Thr Ser Leu Ser Ser Gly His Val

645 650 655

Leu Met Asn Gly Thr Leu Lys Gln Val Leu Leu Val Gly Ala Pro Thr

660 665 670

Tyr Asp Asp Val Ser Lys Val Ala Phe Leu Thr Val Thr Leu His Gln

675 680 685

Gly Gly Ala Thr Arg Met Tyr Ala Leu Ile Ser Asp Ala Gln Pro Leu

690 695 700

Leu Leu Ser Thr Phe Ser Gly Asp Arg Arg Phe Ser Arg Phe Gly Gly

705 710 715 720

Val Leu His Leu Ser Asp Leu Asp Asp Asp Gly Leu Asp Glu Ile Ile

725 730 735

Met Ala Ala Pro Leu Arg Ile Ala Asp Val Thr Ser Gly Leu Ile Gly

740 745 750

Gly Glu Asp Gly Arg Val Tyr Val Tyr Asn Gly Lys Glu Thr Thr Leu
755 760 765

Gly Asp Met Thr Gly Lys Cys Lys Ser Trp Ile Thr Pro Cys Pro Glu
770 775 780

Glu Lys Ala Gln Tyr Val Leu Ile Ser Pro Glu Ala Ser Ser Arg Phe
785 790 795 800

Gly Ser Ser Leu Ile Thr Val Arg Ser Lys Ala Lys Asn Gln Val Val
805 810 815

Ile Ala Ala Gly Arg Ser Ser Leu Gly Ala Arg Leu Ser Gly Ala Leu
820 825 830

His Val Tyr Ser Leu Gly Ser Asp
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<210> 13

<211> 2832

<212> DNA

<213> Homo sapiens

<400> 13

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<210> 14

<211> 2472

<212> DNA

<213> Homo sapiens

<400> 14

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 agatgaaatc atcatggcag cccccctgag gatagcagat gtaacctctg gactgattgg 2340
 gggagaagac ggccgagtat atgtatataa tggcaaagag accacccttg gtgacatgac 2400
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<210> 15

<211> 1942

<212> DNA

<213> Homo sapiens

<400> 15

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 ttctaaaaac tcaattcct tacacaagtc caatacttg gacaggaaac agtagcttg 180
 ttgattatgc tacgtgtct tactgtctat aatgattctt ttatttcagg attcatgtc 240
 ctttatctac aaggctttgg aaaggaacat aaggacaatg tcatagggtg gctctcagt 300
 gtcacaaaag cacgtctcca gcccttagc atcttacttc ttgtcatttc ctatgcgag 360

gcttggtgg gcaatgacct cagctgacct caaccaggat gggcacggtg acctcgtggt 420
 gggcgcacca ggctacagcc gcccggcca catccacatc gggcgcggtg acctcatcta 480
 cggcaatgac ctgggcctgc cacctgtga cctggacctg gacaaggagg cccacaggat 540
 cctgaaggc ttccagccct caggtcggtt tggctcgcc ttgctgtgt tggacttaa 600
 cgtggacggc gtgcctgacc tggccgtgg agctccctcg gtgggctccg agcagctcac 660
 ctacaaaggc gccgtgtatg tctacttgg ttcaaaca ggaggaatgt cttctccc 720
 taacatcacc attcttgcc aggacatcta ctgtaactg ggctggactc tctggctgc 780
 agatgtgaat ggagacagt aaccgatct ggtcatcggc tcccctttg caccagggtg 840
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 aaaactgaac gtggaggcag ccaactggac ggtgagaggc gaggaagact tctcctggt 960
 tggatatcc ctacaggtg tctctgga caacagaacc ttgctgttg ttggagccc 1020
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 cctgggagg gtgtatggct actcccacc aaacggcca agctggtta ccattctgg 1140
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 gacttgaaa caagtgtgc tggttggagc cctacgtac gatgacgtg ctaagggtgc 1260
 attctgacc gtgacctac accaaggcgg agccactcg atgtacgac tcatatctga 1320
 cgcgagcct ctgctgctca gcacctcag cggagaccgc cgcttctcc gatttggtg 1380
 cgttctgac ttgagtacc tggatgatga tggcttagat gaaatcatca tggcagccc 1440
 cctgaggata gcagatgtaa cctctggact gattggggga gaagacggcc gattatatgt 1500
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 tcatgtcca gaagaaaagg ccaatatgt attgattct cctgaagcca gctcaagggt 1620
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 ggtgagcatt ttgatggaca aagtggcaca tccagtggag cggtggtaga tctgataga 1860
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<210> 16

<211> 840

<212> PRT

<213> Homo sapiens

<400> 16

Met Ser Ala Phe Arg Leu Trp Pro Gly Leu Leu Ile Met Leu Gly Ser
1 5 10 15

Leu Cys His Arg Gly Ser Pro Cys Gly Leu Ser Thr His Val Glu Ile
20 25 30

Gly His Arg Ala Leu Glu Phe Leu Gln Leu His Asn Gly Arg Val Asn
35 40 45

Tyr Arg Glu Leu Leu Leu Glu His Gln Asp Ala Tyr Gln Ala Gly Ile
50 55 60

Val Phe Pro Asp Cys Phe Tyr Pro Ser Ile Cys Lys Gly Gly Lys Phe
65 70 75 80

His Asp Val Ser Glu Ser Thr His Trp Thr Pro Phe Leu Asn Ala Ser
85 90 95

Val His Tyr Ile Arg Glu Asn Tyr Pro Leu Pro Trp Glu Lys Asp Thr
100 105 110

Glu Lys Leu Val Ala Phe Leu Phe Gly Ile Thr Ser His Met Ala Ala
115 120 125

Asp Val Ser Trp His Ser Leu Gly Leu Glu Gln Gly Phe Leu Arg Thr
130 135 140

Met Gly Ala Ile Asp Phe His Gly Ser Tyr Ser Glu Ala His Ser Ala
145 150 155 160

Gly Asp Phe Gly Gly Asp Val Leu Ser Gln Phe Glu Phe Asn Phe Asn
165 170 175

Tyr Leu Ala Arg Arg Trp Tyr Val Pro Val Lys Asp Leu Leu Gly Ile
180 185 190

Tyr Glu Lys Leu Tyr Gly Arg Lys Val Ile Thr Glu Asn Val Ile Val
195 200 205

Asp Cys Ser His Ile Gln Phe Leu Glu Met Tyr Gly Glu Met Leu Ala
210 215 220

Val Ser Lys Leu Tyr Pro Thr Tyr Ser Thr Lys Ser Pro Phe Leu Val
225 230 235 240

Glu Gln Phe Gln Glu Tyr Phe Leu Gly Gly Leu Asp Asp Met Ala Phe
245 250 255

Trp Ser Thr Asn Ile Tyr His Leu Thr Ile Phe Met Leu Glu Asn Gly
260 265 270

Thr Ser Asp Cys Asn Leu Pro Glu Asn Pro Leu Phe Ile Ala Cys Gly
275 280 285

Gly Gln Gln Asn His Thr Gln Gly Ser Lys Met Gln Lys Asn Asp Phe
290 295 300

His Arg Asn Leu Thr Thr Ser Leu Thr Glu Ser Val Asp Arg Asn Ile
305 310 315 320

Asn Tyr Thr Glu Arg Gly Val Phe Phe Ser Val Asn Ser Trp Thr Pro
325 330 335

Asp Ser Met Ser Phe Ile Tyr Lys Ala Leu Glu Arg Asn Ile Arg Thr
340 345 350

Met Phe Ile Gly Gly Ser Gln Leu Ser Gln Lys His Val Ser Ser Pro
355 360 365

Leu Ala Ser Tyr Phe Leu Ser Phe Pro Tyr Ala Arg Leu Gly Trp Ala

370 375 380

Met Thr Ser Ala Asp Leu Asn Gln Asp Gly His Gly Asp Leu Val Val

385 390 395 400

Gly Ala Pro Gly Tyr Ser Arg Pro Gly His Ile His Ile Gly Arg Val

405 410 415

Tyr Leu Ile Tyr Gly Asn Asp Leu Gly Leu Pro Pro Val Asp Leu Asp

420 425 430

Leu Asp Lys Glu Ala His Arg Ile Leu Glu Gly Phe Gln Pro Ser Gly

435 440 445

Arg Phe Gly Ser Ala Leu Ala Val Leu Asp Phe Asn Val Asp Gly Val

450 455 460

Pro Asp Leu Ala Val Gly Ala Pro Ser Val Gly Ser Glu Gln Leu Thr

465 470 475 480

Tyr Lys Gly Ala Val Tyr Val Tyr Phe Gly Ser Lys Gln Gly Gly Met

485 490 495

Ser Ser Ser Pro Asn Ile Thr Ile Ser Cys Gln Asp Ile Tyr Cys Asn

500 505 510

Leu Gly Trp Thr Leu Leu Ala Ala Asp Val Asn Gly Asp Ser Glu Pro

515 520 525

Asp Leu Val Ile Gly Ser Pro Phe Ala Pro Gly Gly Gly Lys Gln Lys

530 535 540

Gly Ile Val Ala Ala Phe Tyr Ser Gly Pro Ser Leu Ser Asp Lys Glu

545 550 555 560

Lys Leu Asn Val Glu Ala Ala Asn Trp Thr Val Arg Gly Glu Glu Asp
 565 570 575

Phe Ser Trp Phe Gly Tyr Ser Leu His Gly Val Thr Val Asp Asn Arg
 580 585 590

Thr Leu Leu Leu Val Gly Ser Pro Thr Trp Lys Asn Ala Ser Arg Leu
 595 600 605

Gly His Leu Leu His Ile Arg Asp Glu Lys Lys Ser Leu Gly Arg Val
 610 615 620

Tyr Gly Tyr Phe Pro Pro Asn Gly Gln Ser Trp Phe Thr Ile Ser Gly
 625 630 635 640

Asp Lys Ala Met Gly Lys Leu Gly Thr Ser Leu Ser Ser Gly His Val
 645 650 655

Leu Met Asn Gly Thr Leu Lys Gln Val Leu Leu Val Gly Ala Pro Thr
 660 665 670

Tyr Asp Asp Val Ser Lys Val Ala Phe Leu Thr Val Thr Leu His Gln
 675 680 685

Gly Gly Ala Thr Arg Met Tyr Ala Leu Ile Ser Asp Ala Gln Pro Leu
 690 695 700

Leu Leu Ser Thr Phe Ser Gly Asp Arg Arg Phe Ser Arg Phe Gly Gly
 705 710 715 720

Val Leu His Leu Ser Asp Leu Asp Asp Asp Gly Leu Asp Glu Ile Ile
 725 730 735

Met Ala Ala Pro Leu Arg Ile Ala Asp Val Thr Ser Gly Leu Ile Gly
 740 745 750

Gly Glu Asp Gly Arg Val Tyr Val Tyr Asn Gly Lys Glu Thr Thr Leu
 755 760 765

Gly Asp Met Thr Gly Lys Cys Lys Ser Trp Ile Thr Pro Cys Pro Glu
 770 775 780

Glu Lys Ala Gln Tyr Val Leu Ile Ser Pro Glu Ala Ser Ser Arg Phe
 785 790 795 800

Gly Ser Ser Leu Ile Thr Val Arg Ser Lys Ala Lys Asn Gln Val Val
 805 810 815

Ile Ala Ala Gly Arg Ser Ser Leu Gly Ala Arg Leu Ser Gly Ala Leu
 820 825 830

His Val Tyr Ser Leu Gly Ser Asp
 835 840

<210> 17

<211> 510

<212> PRT

<213> Homo sapiens

<400> 17

Met Ile Leu Leu Phe Gln Asp Ser Met Ser Phe Ile Tyr Lys Ala Leu
 1 5 10 15

Glu Arg Asn Ile Arg Thr Met Phe Ile Gly Gly Ser Gln Leu Ser Gln
 20 25 30

Lys His Val Ser Ser Pro Leu Ala Ser Tyr Phe Leu Ser Phe Pro Tyr
 35 40 45

Ala Arg Leu Gly Trp Ala Met Thr Ser Ala Asp Leu Asn Gln Asp Gly
50 55 60

His Gly Asp Leu Val Val Gly Ala Pro Gly Tyr Ser Arg Pro Gly His
65 70 75 80

Ile His Ile Gly Arg Val Tyr Leu Ile Tyr Gly Asn Asp Leu Gly Leu
85 90 95

Pro Pro Val Asp Leu Asp Leu Asp Lys Glu Ala His Arg Ile Leu Glu
100 105 110

Gly Phe Gln Pro Ser Gly Arg Phe Gly Ser Ala Leu Ala Val Leu Asp
115 120 125

Phe Asn Val Asp Gly Val Pro Asp Leu Ala Val Gly Ala Pro Ser Val
130 135 140

Gly Ser Glu Gln Leu Thr Tyr Lys Gly Ala Val Tyr Val Tyr Phe Gly
145 150 155 160

Ser Lys Gln Gly Gly Met Ser Ser Ser Pro Asn Ile Thr Ile Ser Cys
165 170 175

Gln Asp Ile Tyr Cys Asn Leu Gly Trp Thr Leu Leu Ala Ala Asp Val
180 185 190

Asn Gly Asp Ser Glu Pro Asp Leu Val Ile Gly Ser Pro Phe Ala Pro
195 200 205

Gly Gly Gly Lys Gln Lys Gly Ile Val Ala Ala Phe Tyr Ser Gly Pro
210 215 220

Ser Leu Ser Asp Lys Glu Lys Leu Asn Val Glu Ala Ala Asn Trp Thr

225 230 235 240

Val Arg Gly Glu Glu Asp Phe Ser Trp Phe Gly Tyr Ser Leu His Gly

245 250 255

Val Thr Val Asp Asn Arg Thr Leu Leu Leu Val Gly Ser Pro Thr Trp

260 265 270

Lys Asn Ala Ser Arg Leu Gly His Leu Leu His Ile Arg Asp Glu Lys

275 280 285

Lys Ser Leu Gly Arg Val Tyr Gly Tyr Phe Pro Pro Asn Gly Gln Ser

290 295 300

Trp Phe Thr Ile Ser Gly Asp Lys Ala Met Gly Lys Leu Gly Thr Ser

305 310 315 320

Leu Ser Ser Gly His Val Leu Met Asn Gly Thr Leu Lys Gln Val Leu

325 330 335

Leu Val Gly Ala Pro Thr Tyr Asp Asp Val Ser Lys Val Ala Phe Leu

340 345 350

Thr Val Thr Leu His Gln Gly Gly Ala Thr Arg Met Tyr Ala Leu Ile

355 360 365

Ser Asp Ala Gln Pro Leu Leu Leu Ser Thr Phe Ser Gly Asp Arg Arg

370 375 380

Phe Ser Arg Phe Gly Gly Val Leu His Leu Ser Asp Leu Asp Asp Asp

385 390 395 400

Gly Leu Asp Glu Ile Ile Met Ala Ala Pro Leu Arg Ile Ala Asp Val

405 410 415

Thr Ser Gly Leu Ile Gly Gly Glu Asp Gly Arg Val Tyr Val Tyr Asn
 420 425 430

Gly Lys Glu Thr Thr Leu Gly Asp Met Thr Gly Lys Cys Lys Ser Trp
 435 440 445

Ile Thr Pro Cys Pro Glu Glu Lys Ala Gln Tyr Val Leu Ile Ser Pro
 450 455 460

Glu Ala Ser Ser Arg Phe Gly Ser Ser Leu Ile Thr Val Arg Ser Lys
 465 470 475 480

Ala Lys Asn Gln Val Val Ile Ala Ala Gly Arg Ser Ser Leu Gly Ala
 485 490 495

Arg Leu Ser Gly Ala Leu His Val Tyr Ser Leu Gly Ser Asp
 500 505 510

<210> 18

<211> 795

<212> PRT

<213> Homo sapiens

<400> 18

Met Ser Ala Phe Arg Leu Trp Pro Gly Leu Leu Ile Met Leu Gly Ser
 1 5 10 15

Leu Cys His Arg Gly Ser Pro Cys Gly Leu Ser Thr His Ile Glu Ile
 20 25 30

Gly His Arg Ala Leu Glu Phe Leu Gln Leu His Asn Gly Arg Val Asn
 35 40 45

Tyr Arg Glu Leu Leu Leu Glu His Gln Asp Ala Tyr Gln Ala Gly Ile
50 55 60

Val Phe Pro Asp Cys Phe Tyr Pro Ser Ile Cys Lys Gly Gly Lys Phe
65 70 75 80

His Asp Val Ser Glu Ser Thr His Trp Thr Pro Phe Leu Asn Ala Ser
85 90 95

Val His Tyr Ile Arg Glu Asn Tyr Pro Leu Pro Trp Glu Lys Asp Thr
100 105 110

Glu Lys Leu Val Ala Phe Leu Phe Gly Ile Thr Ser His Met Ala Ala
115 120 125

Asp Val Ser Trp His Ser Leu Gly Leu Glu Gln Gly Phe Leu Arg Thr
130 135 140

Met Gly Ala Ile Asp Phe His Gly Ser Tyr Ser Glu Ala His Ser Ala
145 150 155 160

Gly Asp Phe Gly Gly Asp Val Leu Ser Gln Phe Glu Phe Asn Phe Asn
165 170 175

Tyr Leu Ala Arg Arg Trp Tyr Val Pro Val Lys Asp Leu Leu Gly Ile
180 185 190

Tyr Glu Lys Leu Tyr Gly Arg Lys Val Ile Thr Glu Asn Val Ile Val
195 200 205

Asp Cys Ser His Ile Gln Phe Leu Glu Met Tyr Gly Glu Met Leu Ala
210 215 220

Val Ser Lys Leu Tyr Pro Thr Tyr Ser Thr Lys Ser Pro Phe Leu Val
225 230 235 240

Glu Gln Phe Gln Glu Tyr Phe Leu Gly Gly Leu Asp Asp Met Ala Phe
245 250 255

Trp Ser Thr Asn Ile Tyr His Leu Thr Ser Phe Met Leu Glu Asn Gly
260 265 270

Thr Ser Asp Cys Asn Leu Pro Glu Asn Pro Leu Phe Ile Ala Cys Gly
275 280 285

Gly Gln Gln Asn His Thr Gln Gly Ser Lys Met Gln Lys Asn Asp Phe
290 295 300

His Arg Asn Leu Thr Thr Ser Leu Thr Glu Ser Val Asp Arg Asn Ile
305 310 315 320

Asn Tyr Thr Glu Arg Gly Val Phe Phe Ser Val Asn Ser Trp Thr Pro
325 330 335

Asp Ser Met Ser Phe Ile Tyr Lys Ala Leu Glu Arg Asn Ile Arg Thr
340 345 350

Met Phe Ile Gly Gly Ser Gln Leu Ser Gln Lys His Val Ser Ser Pro
355 360 365

Leu Ala Ser Tyr Phe Leu Ser Phe Pro Tyr Ala Arg Leu Gly Trp Ala
370 375 380

Met Thr Ser Ala Asp Leu Asn Gln Asp Gly His Gly Asp Leu Val Val
385 390 395 400

Gly Ala Pro Gly Tyr Ser Arg Pro Gly His Ile His Ile Gly Arg Val
405 410 415

Tyr Leu Ile Tyr Gly Asn Asp Leu Gly Leu Pro Pro Val Asp Leu Asp

420 425 430

Leu Asp Lys Glu Ala His Arg Ile Leu Glu Gly Phe Gln Pro Ser Gly

435 440 445

Arg Phe Gly Ser Ala Leu Ala Val Leu Asp Phe Asn Val Asp Gly Val

450 455 460

Pro Asp Leu Ala Val Gly Ala Pro Ser Val Gly Ser Glu Gln Leu Thr

465 470 475 480

Tyr Lys Gly Ala Val Tyr Val Tyr Phe Gly Ser Lys Gln Gly Gly Met

485 490 495

Ser Ser Ser Pro Asn Ile Thr Ile Ser Cys Gln Asp Ile Tyr Cys Asn

500 505 510

Leu Gly Trp Thr Leu Leu Ala Ala Asp Val Asn Gly Asp Ser Glu Pro

515 520 525

Asp Leu Val Ile Gly Ser Pro Phe Ala Pro Gly Gly Gly Lys Gln Lys

530 535 540

Gly Ile Val Ala Ala Phe Tyr Ser Gly Pro Ser Leu Ser Asp Lys Glu

545 550 555 560

Lys Leu Asn Val Glu Ala Ala Asn Trp Thr Val Arg Gly Glu Glu Asp

565 570 575

Phe Ser Trp Phe Gly Tyr Ser Leu His Gly Val Thr Val Asp Asn Arg

580 585 590

Thr Leu Leu Leu Val Gly Ser Pro Thr Trp Lys Asn Ala Ser Arg Leu

595 600 605

Gly His Leu Leu His Ile Arg Asp Glu Lys Lys Ser Leu Gly Arg Val
610 615 620

Tyr Gly Tyr Phe Pro Pro Asn Gly Gln Ser Trp Phe Thr Ile Ser Gly
625 630 635 640

Asp Lys Ala Met Gly Lys Leu Gly Thr Ser Leu Ser Ser Gly His Val
645 650 655

Leu Met Asn Gly Thr Leu Lys Gln Val Leu Leu Val Gly Ala Pro Thr
660 665 670

Tyr Asp Asp Val Ser Lys Val Ala Phe Leu Thr Val Thr Leu His Gln
675 680 685

Gly Gly Ala Thr Arg Met Tyr Ala Leu Ile Ser Asp Ala Gln Pro Leu
690 695 700

Leu Leu Ser Thr Phe Ser Gly Asp Arg Arg Phe Ser Arg Phe Gly Gly
705 710 715 720

Val Leu His Leu Ser Asp Leu Asp Asp Asp Gly Leu Asp Glu Ile Ile
725 730 735

Met Ala Ala Pro Leu Arg Ile Ala Asp Val Thr Ser Gly Leu Ile Gly
740 745 750

Gly Glu Asp Gly Arg Val Tyr Val Tyr Asn Gly Lys Glu Thr Thr Leu
755 760 765

Gly Asp Met Thr Gly Lys Cys Lys Ser Trp Ile Thr Pro Cys Pro Glu
770 775 780

Glu Lys Val Ser Glu Lys Lys Lys Lys Lys Lys
785 790 795

<210> 19

<211> 840

<212> PRT

<213> Homo sapiens

<400> 19

Met Ser Ala Phe Arg Leu Trp Pro Gly Leu Leu Ile Met Leu Gly Ser
1 5 10 15

Leu Cys His Arg Gly Ser Pro Cys Gly Leu Ser Thr His Ile Glu Ile
20 25 30

Gly His Arg Ala Leu Glu Phe Leu Gln Leu His Asn Gly Arg Val Asn
35 40 45

Tyr Arg Glu Leu Leu Leu Glu His Gln Asp Ala Tyr Gln Ala Gly Ile
50 55 60

Val Phe Pro Asp Cys Phe Tyr Pro Ser Ile Cys Lys Gly Gly Lys Phe
65 70 75 80

His Asp Val Ser Glu Ser Thr His Trp Thr Pro Phe Leu Asn Ala Ser
85 90 95

Val His Tyr Ile Arg Glu Asn Tyr Pro Leu Pro Trp Glu Lys Asp Thr
100 105 110

Glu Lys Leu Val Ala Phe Leu Phe Gly Ile Thr Ser His Met Ala Ala
115 120 125

Asp Val Ser Trp His Ser Leu Gly Leu Glu Gln Gly Phe Leu Arg Thr
130 135 140

Met Gly Ala Ile Asp Phe His Gly Ser Tyr Ser Glu Ala His Ser Ala
145 150 155 160

Gly Asp Phe Gly Gly Asp Val Leu Ser Gln Phe Glu Phe Asn Phe Asn
 165 170 175

Tyr Leu Ala Arg Arg Trp Tyr Val Pro Val Lys Asp Leu Leu Gly Ile
 180 185 190

Tyr Glu Lys Leu Tyr Gly Arg Lys Val Ile Thr Glu Asn Val Ile Val
 195 200 205

Asp Cys Ser His Ile Gln Phe Leu Glu Met Tyr Gly Glu Met Leu Ala
 210 215 220

Val Ser Lys Leu Tyr Pro Thr Tyr Ser Thr Lys Ser Pro Phe Leu Val
225 230 235 240

Glu Gln Phe Gln Glu Tyr Phe Leu Gly Gly Leu Asp Asp Met Ala Phe
 245 250 255

Trp Ser Thr Asn Ile Tyr His Leu Thr Ser Phe Met Leu Glu Asn Gly
 260 265 270

Thr Ser Asp Cys Asn Leu Pro Glu Asn Pro Leu Phe Ile Ala Cys Gly
 275 280 285

Gly Gln Gln Asn His Thr Gln Gly Ser Lys Met Gln Lys Asn Asp Phe
 290 295 300

His Arg Asn Leu Thr Thr Ser Leu Thr Glu Ser Val Asp Arg Asn Ile
305 310 315 320

Asn Tyr Thr Glu Arg Gly Val Phe Phe Ser Val Asn Ser Trp Thr Pro

325 330 335

Asp Ser Met Ser Phe Ile Tyr Lys Ala Leu Glu Arg Asn Ile Arg Thr

340 345 350

Met Phe Ile Gly Gly Ser Gln Leu Ser Gln Lys His Val Ser Ser Pro

355 360 365

Leu Ala Ser Tyr Phe Leu Ser Phe Pro Tyr Ala Arg Leu Gly Trp Ala

370 375 380

Met Thr Ser Ala Asp Leu Asn Gln Asp Gly His Gly Asp Leu Val Val

385 390 395 400

Gly Ala Pro Gly Tyr Ser Arg Pro Gly His Ile His Ile Gly Arg Val

405 410 415

Tyr Leu Ile Tyr Gly Asn Asp Leu Gly Leu Pro Pro Val Asp Leu Asp

420 425 430

Leu Asp Lys Glu Ala His Arg Ile Leu Glu Gly Phe Gln Pro Ser Gly

435 440 445

Arg Phe Gly Ser Ala Leu Ala Val Leu Asp Phe Asn Val Asp Gly Val

450 455 460

Pro Asp Leu Ala Val Gly Ala Pro Ser Val Gly Ser Glu Gln Leu Thr

465 470 475 480

Tyr Lys Gly Ala Val Tyr Val Tyr Phe Gly Ser Lys Gln Gly Gly Met

485 490 495

Ser Ser Ser Pro Asn Ile Thr Ile Ser Cys Gln Asp Ile Tyr Cys Asn

500 505 510

Leu Gly Trp Thr Leu Leu Ala Ala Asp Val Asn Gly Asp Ser Glu Pro
515 520 525

Asp Leu Val Ile Gly Ser Pro Phe Ala Pro Gly Gly Gly Lys Gln Lys
530 535 540

Gly Ile Val Ala Ala Phe Tyr Ser Gly Pro Ser Leu Ser Asp Lys Glu
545 550 555 560

Lys Leu Asn Val Glu Ala Ala Asn Trp Thr Val Arg Gly Glu Glu Asp
565 570 575

Phe Ser Trp Phe Gly Tyr Ser Leu His Gly Val Thr Val Asp Asn Arg
580 585 590

Thr Leu Leu Leu Val Gly Ser Pro Thr Trp Lys Asn Ala Ser Arg Leu
595 600 605

Gly His Leu Leu His Ile Arg Asp Glu Lys Lys Ser Leu Gly Arg Val
610 615 620

Tyr Gly Tyr Phe Pro Pro Asn Gly Gln Ser Trp Phe Thr Ile Ser Gly
625 630 635 640

Asp Lys Ala Met Gly Lys Leu Gly Thr Ser Leu Ser Ser Gly His Val
645 650 655

Leu Met Asn Gly Thr Leu Lys Gln Val Leu Leu Val Gly Ala Pro Thr
660 665 670

Tyr Asp Asp Val Ser Lys Val Ala Phe Leu Thr Val Thr Leu His Gln
675 680 685

Gly Gly Ala Thr Arg Met Tyr Ala Leu Ile Ser Asp Ala Gln Pro Leu
690 695 700

Leu Leu Ser Thr Phe Ser Gly Asp Arg Arg Phe Ser Arg Phe Gly Gly
705 710 715 720

Val Leu His Leu Ser Asp Leu Asp Asp Asp Gly Leu Asp Glu Ile Ile
725 730 735

Met Ala Ala Pro Leu Arg Ile Ala Asp Val Thr Ser Gly Leu Ile Gly
740 745 750

Gly Glu Asp Gly Arg Val Tyr Val Tyr Asn Gly Lys Glu Thr Thr Leu
755 760 765

Gly Asp Met Thr Gly Lys Cys Lys Ser Trp Ile Thr Pro Cys Pro Glu
770 775 780

Glu Lys Ala Gln Tyr Val Leu Ile Ser Pro Glu Ala Ser Ser Arg Phe
785 790 795 800

Gly Ser Ser Leu Ile Thr Val Arg Ser Lys Ala Lys Asn Gln Val Val
805 810 815

Ile Ala Ala Gly Arg Ser Ser Leu Gly Ala Arg Leu Ser Gly Ala Leu
820 825 830

His Val Tyr Ser Leu Gly Ser Asp
835 840

<210> 20

<211> 3378

<212> DNA

<213> Homo sapiens

<400> 20

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 cgagagaact atccccttc ctgggagaag gacacagaga aactggtagc ttcttgtt 360
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 gaacaattcc aagagtattt tcttgagga ctggatgata tggcatttg gtccactaat 780
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ttctgaccg tgaccctaca ccaaggcgga gccactcgca tgtacgcact catatctgac 2100
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3378

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<211> 2915

<212> DNA

<213> Homo sapiens

<400> 21

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<210> 22

<211> 2472

<212> DNA

<213> Homo sapiens

<400> 22

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2472

<210> 23

<211> 1962

<212> DNA

<213> Homo sapiens

<400> 23

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<210> 24

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo

<400> 24

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<210> 25

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo

<400> 25

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<210> 26

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo

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<210> 27

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo

<400> 27

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<210> 28

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo

<400> 28

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<210> 29

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo

<400> 29

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<210> 30

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo

<400> 30

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32

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correct